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ABSTRACT

Teacher effectiveness research has used changing criteria over the years in assessing and evaluating teacher performance and its effect on student achievement. Early researchers accepted the idea that there should be a relationship between the personality or traits of the teacher and student outcomes. Lists of characteristics of superior teachers were used to measure teacher behaviors. A change of focus took place when researchers began to examine teaching processes by systematically observing classroom behavior. Subsequent teacher effectiveness research postulated that successful teachers believe that their major task is to teach and allot more time for instruction. Thus, the focus shifted to studies of the teacher behaviors that lead to efficient use of time on the part of students. Various studies have indicated that parental expectations and the student's prior achievement, measured intelligence, and socioeconomic status may have a greater impact upon a student's achievement than teachers and the school. The question is raised as to how true equality of opportunity may bring about greater academic achievement for all students. (JD)

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TEACHER BEHAVIOR - PUPIL EFFECT AND INSTRUCTIONAL IMPROVEMENT

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In the training of and the literature about the principalship, there has always been a concern and an emphasis upon the principal's role as an instructional leader. An important dimension of the instructional leadership role is supervision - the improvement of teacher competence. To do this, supervisors are expected to have interpersonal skills (an awareness of and sensitivity about the vagaries of motives and personalities), an ability to communicate, a knowledge of learning theories, and assessment and evaluation skills. Presumably, with these, a principal (or supervisor) is expected to positively influence the relationship between teacher behavior and pupil effect.

Assessing and evaluating teacher performance has always been bothersome and difficult and definitive answers for doing it illusory. In the past, there was an acceptance of the common sense notion that there should be a relationship between the personality (or traits) of teachers and student outcomes. So early researchers asked pupils or panels of experts or administrators to describe effective teachers. The list of characteristics of superior teachers frequently included such traits as enthusiasm, consideration, adaptability, dynamism, cooperation, personal appearance and so on.[1] From these studies, evaluation forms (or rating scales) were designed to assess teacher performance and to make other judgments about teachers. Teachers have always resented these forms (or scales) because they feel that the forms (or scales) are subjective rather than objective. Usually, studies of these schedules have indicated that high or low ratings seem to be determined by

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the personal and role relationship between rater and ratee.[2] Moreover, there is little or no evidence which link perceived teacher characteristics to demonstrable pupil achievement.[3]

Early, too, in the history of educational research, methods experiments began to be done. Typically, two or more classes were taught by different methods and the mean gain in the achievement of the classes taught by each method were compared to discover the most effective. In these studies, the class rather than the teacher was the unit of analysis. The results have been inconclusive and inconsistent.[4] In addition, since replications were seldom done, the data obtained from methods experiments could rarely be generalized.[5] The major flaw of these studies, as Dunkin and Biddle[6] and others have noted, was that they failed to observe and record what was occurring in the classroom. Methods experiments, then, ignored the complexities of teaching-learning, the possibility that effect might vary from context to context and the probability that teachers differ in effect because they differ in classroom behavior.

By the sixties, this had changed. Researchers began to examine the processes of teaching and to systematically observe classroom behavior. The focus of process-product research has been upon stable behavior patterns - behaviors which remain relatively unchanged across observations. This type of research proliferated with the development by Flanders, Amidon and others of interaction instruments for coding and analyzing observations. By 1970, there were reports of 79 different systems for observing classrooms. Yet, despite the profusion of studies of classroom events, the effects of teaching remained a mystery.[8] In a review of research up to 1974, Harvey A. Averch, et al, examined process-product studies and concluded that

> the process approach has not identified the very specific student relations involved in learning and education.

> There seems to be interactions between students and teachers, between students and methods, and (more complex of all) among students, teachers and methods. The complex three-way interactions have not yet been studied carefully.(9)

They also noticed that

> few studies maintain adequate controls over what actually goes on in the classroom as it relates to achievement. Data on classroom transactions are the only source of information on the content of the student-teacher relationship. Studies that omit transactions data can hope to identify only broad associations among variables that hold no matter what might be the nature of the relationship between student and teacher. Researchers' results may well be affected by circumstances unrecognized in their analyses.(10)

Dunkin and Biddle agreed. Their criticisms of process-product research included the failure of most studies to report the strength of the relationship between a teaching variable and some other, to provide information showing that the relationship was independent of other effects, or because the findings had not been validated experimentally.[11] Robert W. Heath and Mark A. Neilson reanalyzed (1974) a study by Rosenshine and Furst which reviewed over fifty studies about teacher effect and, from them, inferred that eleven teacher-learner variables (such as clarity, enthusiasm, indirectness, probing, etc.)[12] were worthy of further study. Heath and Neilson concluded that these studies were flawed by definitional, methodological and design problems. In addition, they contended, the statistical analyses were untrustworthy because "critically important assumptions such as linearity, normality, homogeneity of variance, and parallel slopes are almost universally unreported."[13] Richard Shavelson and Nancy Dempsey-Atwood continued the questioning in "Generalizability of Measures of Teaching Behavior" (1976). Neither the teaching effectiveness paradigm which used pupil outcomes as measures, they wrote, nor the teaching process paradigm had

> . . . identified consistent, replicable features of human learning that lead directly - or even indirectly - to valued student outcomes. Consistent conclusions from research on teaching are that teacher effects on pupil outcomes are unstable (Rosenshine, 1970), that teaching acts themselves may be unstable (Moon, 1971), and that most teaching acts are unrelated to student outcomes (Heath & Nelson, 1973).(14)

N. L. Gage responded to the doubts about the usefulness of process-product studies in The Scientific Bases of the Art of Teaching. The mistake of the surveys which found that research had produced equivocal or non-significant findings, according to Gage, was that their judgments were based upon statistical significance, or the nonattributability of chance, of the results of single studies. They were, then, committing a Type II error - of assuming a relationship between a single variable of teacher behavior and pupil achievement, Gage pointed out, is expectedly low because no single dimension will account for a large portion of the variance and because the samples are always small. Different results, however, are obtained when the size of the sample and the magnitude of the relationship are considered. When this is done, statistically significant, or non-chance, results are found. Glass and his co-workers, Gage noted, have calculated the strength of the experimental effect of studies rather than merely significance or non-significance. They used

> . . . effect size as a measure of the strength or importance of an effect. Effect size is calculated by subtracting the mean on the outcome variable in the control group from the mean of the same variable in the experimental group and dividing the result by the standard deviation of the control group. This gives an indication of the size of the difference in effect between the two groups in terms of the standard deviation. Effects sizes can then be averaged across differences (for example, one standard deviation or more) or much less difference (for example, .5 standard deviation or less).(16)

What needs to be known, then, about process-product relationships, is whether they can identify teacher behaviors which demonstrably relate to student outcomes? From examinations of these correlations,[17] Gage insisted, there has emerged a pattern for effectively teaching reading and mathematics in the elementary grades.

Jere E. Brophy agreed. His research[18] and review of teacher effect studies led to the following postulates. Teachers who believe that their major task is to teach and allot more time to instruction are more successful. Effective teachers are efficient organizers and develop procedures which increase student academic engaged time, which decrease the time lost during transitions, and which minimize disruptions which require discipline. And students taught content that is structured by the teacher achieve more than students in individualized or discovery learning programs.[19]

> The instruction that seems most efficient involves the teacher working with the whole class (or with small groups in the early grades), presenting information in lectures/demonstrations and then following them up with recitations or practice exercises in which the students get opportunities to make responses and get corrective feedback. The teacher maintains an academic focus, keeping the students involved in a lesson or engaged in seatwork, monitoring their performance, and providing individual feedback. The pace is rapid in the sense that the class moves efficiently through the curriculum as a whole (and through successive objectives of any given lesson), but progress from one objective to the next involves very small, easy steps. Success rates in answering teacher questions during lessons are high (about 75%), and success rates on assignments designed to be done independently are very high (approaching 100%).
>
> These specifics vary somewhat with context, particularly grade level and student ability. Within any given grade level, teachers working with low ability students need to move at a slower pace and provide more repetition and individualized monitoring to make sure that overlearning is attained before moving on to objectives that assume prior mastery of present objectives, and to supply greater warmth, encouragement, and personalized teaching generally, but less challenge (although not less than the students can handle) and fewer demands or criticisms.(20)

Like Brophy and others,[21] Barak V. Rosenshine has inferred from research published during the seventies about teaching basic skills in the elementary school that, generally, teacher effect studies have found that

> time spent engaged in relevant content appears to be essential for achievement, and effective classroom teaching of basic skills, therefore, takes place in an environment characterized by an emphasis on academic achievement. Teaching behavior not directly aimed at furthering academic achievement of the kind measured by standardized tests does not result in much academic gain. Teachers who make a difference in students' achievement are those who put students into contact with curriculum materials and find ways to keep them in contact. Although nonacademic activities, nonacademic questions, and a concern with a student's opinions and personal life may have motivational value, such activities do not in themselves represent academically engaged time. In addition, as laudable as it may seem to offer choices to students and to have them work on their unique, individualized assignments, such activities are usually low in academically engaged time. The more successful teacher is one who structures and selects the activities, whose students are academically engaged for many minutes each day, who tend to ask questions that have specific answers in a controlled-practice format, who places students in groups where they are supervised by the teacher, and who does all of this in a controlled but convivial classroom.(22)

But, as Rosenshine and others have pointed out, there is still much that is unknown about "direct teaching". While it is an approach which is being advocated for the learning of basic skills, is it the best approach for the attainment of other curricular objectives? If not, what is the "trade-off" between the achievement of cognitive gains and the achievement of affective gains? Of interest, too, is whether the results gleaned from elementary schools are generalizable to secondary schools? Obviously, then, there is a need for studies of various grades, other subjects and different contexts. Perhaps these will provide information about the quality and quantity of engaged minutes in pupil learning of specified objectives, the relation to skill achievement of teacher-directed and self-paced activities,

about content to be covered for "mastery" by high and low SES students, the relation between the quantity and quality of various teacher-pupil interactions and desired effects, and the list could go on and on. Thus, while the data we have is both persuasive and suggestive, perhaps it might be wise to wait for additional research and analyses before developing prescriptions for what teachers ought to do and encouraging a prompt implementation of them in elementary classrooms.

Educators, however, are committed to improving instruction and, given the intense political and public pressure for educational results, the temptation to act without more evidence can be over-powering. Consequently, whether it is advisable or not, it is inevitable that there will be those who will ask about the implications of teacher effect studies for improving teaching-learning and urge principals (or supervisors) to infuse classrooms with what is known. Gordon Cawelti, for instance, is convinced that "appropriate leader behaviors enhances student achievement." In a model for instructional leadership which he designed, successful instructional leaders possess instructional improvement process skills, clinical supervision skills, staff development skills and teacher evaluation skills which concentrate upon the seven characteristics of effective teachers.

1. high expectations for students
2. frequent monitoring of student progress
3. favorable climate for learning
4. appropriate level of difficulty in materials
5. routinized classroom management tasks
6. opportunity to learn criterion material
7. adequate time on task(23)

These variables, Cawalti told his readers, correlate with high student achievement. Moreover, they are controlled by the school and lend themselves to staff development. What had to be asked and resolved, Cawalti stated, was what staff development activities are needed by teachers who do not have the

research-based teacher effectiveness characteristics?

We suppose that conventional wisdom would have principals (or supervisors) begin the implementation of teacher-effect research by conducting workshops to discuss what the studies have found, to offer suggestions for applying the results, by helping to plan for future instruction and by providing necessary resources. We would contend, however, that the critical supervisory task is to develop a process that focuses upon collecting and analyzing information about teaching and learning in the classroom and that the supervisory emphasis should be upon describing behaviors and practices which increase academic engaged time. If this is the thrust of supervision, then a useful concept is academic learning time - the amount of time a student spends upon an academic task with high success.

The basic components of academic learning time (ALT) are allocated time, student engagement and student success rate (the match between the task and the student). If data about academic learning time (ALT) were available, teachers could objectively review their classroom behavior, would have a basis for modifying or altering what they do, would be able to observe the results of their efforts, and would have immediate feedback about their progress toward goals which were realistic, job related and useful.[24] Or, as David C. Berliner explained,

> if the type of treatment and the duration of treatment are crucial variables in the determination of what is learned and how much is learned, then between-class differences in allocated time in content areas, and in total allocated time per day or per school year, become important operationally defined behavioral indicators of the instructional treatment. If learning is likely to occur only when students attend to the instruction offered them, then between-class differences in engaged time become an important operationally defined behavioral indicator of the effective stimulus situation, as opposed to the nominal stimulus

> situation. And, finally, if learning primarily takes place when students are engaged with materials and activities that are of an easy level of difficulty for that particular student, then ALT becomes an important operationally defined behavioral indicator of student learning.
>
> Even without data relating allocated time, and ALT achievement, these descriptive data have a certain obvious validity, and they can, moreover, lead teachers and supervisors of teachers to examine classroom processes in ways that logically relate to student achievement. Without turning classes into authoritarian factories of learning, many teachers can improve their effectiveness by attending to these variables and reorganizing classroom practices to maximize teaching time and learning time - resources over which they have considerable personal control.(25)

If the results of teacher effect studies are to be applied, they will have to be adjusted and fitted to the realities of the classroom. To do this, it would be useful to know about how teachers make instructional decisions, decide what is or is not appropriate and make the judgments that they do.[26] Such questions have led to a research interest in teachers' decision making.[27] Factors involved in pre-instructional decisions include information about students, educational beliefs and the instructional task (content and goals). From these, teachers make inferences about students, select from instructional alternatives and arrive at a particular educational decision. Apparently, what teachers attempt to do is to reduce the complexity and increase the predictability of classroom activities. When teaching, a teacher is constantly assessing, processing cues and making judgments. After teaching, teachers evaluate and make post-instructional decisions. Thus, through an understanding of the pre-active, inter-active and post-active behavior of teachers, perhaps clues and links can be found for easing and insuring teacher acceptance and adoption of practices which relate to student achievement.

A major problem in the study of teaching and learning is how to estimate how much of an influence schools can be expected to have on pupil outcomes.

Since the mid-sixties, researchers have tried to trace the immediate and long-term effects of schooling. Various studies have indicated that parental expectations, the student's prior achievement, the student's measured intelligence and the socio-economic status of the family may have a greater impact upon a student's achievement than do teachers and the school. Yet, there is an insistence that the schools should be doing better than they do. The rub, however, is to precisely define what is meant by "better". There are some who have (and still) argue that the main cause of inequality in American life has been the inequality in education and that the schools must become instruments for reducing that inequality. The question is (and remains), then, can the schools make a significant difference in the achievement of lower socio-economic and minority children?

As the common school evolved in the 19th century, equality of opportunity came to mean providing free elementary education, a common curriculum and having children from diverse backgrounds attend the same school. Thus, the community provided the opportunity and the student (and family) were responsible for achievement. In the 20th century, as large numbers of adolescents began to attend, the curriculum of the secondary school was diversified. Since it was assumed that students would have different futures, it followed that equality of opportunity required different curricula. In 1954 (Brown vs The School Board of Topeka, Kansas), the Supreme Court ruled that "separate but equal" schools were unconstitutional. The essence of the decision was that the effects of separate schools were or were likely to be different. So began a concept of equality which focused upon the effects of schooling. The implication was (and is) that the responsibility for achievement lies with the school, not the student. Absolute equality of opportunity, as James A. Coleman has pointed out, could be attained only if all out-of-school influences were eliminated.

Since this cannot be done,

> the concept becomes one of degree of proximity to equality of opportunity. This proximity is determined, then, not merely by the equality of educational inputs, but by the intensity of the school's influence relative to the external divergent influences. That is, equality of output is not so much determined by equality of the resource inputs but by the power of these resources to bring about achievement.(28)

The difference in achievement, then, at grade six (or eight or twelve) between the average minority student and the average white student is a measure of the degree of inequality of opportunity. Whether teacher effect research together with compensatory and remedial programs can reduce that inequality remains to be seen.

NOTES

1. Donald M. Medley, "The Effectiveness of Teachers," in Research on Teaching: Concepts, Findings, and Implications, eds. Penelope L. Peterson and Herbert J. Walberg (Berkeley, Calif.: McCutchan Publishing Corporation, 1979), p. 13.
2. William H. Lucio and John D. McNeil, Supervision: A Synthesis of Thought and Action (New York: McGraw-Hill Book Company, Inc., 1962), p. 209. Also see Chapter 10.
3. Hazel Davis, "Evolution of Current Practices in Evaluating Teacher Competence," eds. Bruce J. Biddle and William J. Ellena (New York: Holt, Rinehart and Winston, 1964); Michael J. Dunkin and Bruce J. Biddle, The Study of Teaching (New York: Holt, Rinehart and Winston, 1974), pp. 59-60; and David G. Ryans, Characteristics of Teachers: Their Description, Comparison, and Appraisal (Washington, D.C.: American Council on Education, 1960).
4. Review, for example, the continuing quarrel over the N. Bennett study of Teaching Style and Pupil Progress (Cambridge, Mass.: Harvard University Press, 1976).
5. Medley, op. cit., p. 14.
6. Dunkin and Biddle, op. cit., p. 12-15.
7. David C. Furman and David W. Chapman, "Research on Teaching: Why the Lack of Practical Results?" Educational Technology (January, 1979, Vol. XIX, No. 1), p. 38.
8. Dunkin and Biddle, op. cit., pp. 15-16.
9. Harvey A. Averch, Stephen J. Carroll, Theodore S. Donaldson, Herbert J. Kiesling, and John Pincus, "How Effective is Schooling?" in The Inequality Controversy: Schooling and Distributive Justice, eds. Donald M. Levine and Mary Jo Bane (New York: Basic Books, Inc., 1975), p. 73.

10. Ibid., p. 76.
11. Dunkin and Biddle, op. cit., p. 359.
12. Robert W. Heath and Mark A. Nelson, "The Research Basis for Performance-Based Teacher Education," Review of Educational Research (Fall, 1974, Vo. 44, No. 4). The eleven teaching variables were: (1) clarity, (2) variability, (3) enthusiasm, (4) task-oriented, (5) student opportunity to learn criterion material, (6) use of student ideas and general indirectness, (7) criticism, (8) use of structuring comments, (9) types of questions, (10) probing, (11) level of difficulty of instruction.
13. Ibid., p. 476.
14. Richard Shavelson and Nancy Dempsey-Atwood, "Generalizability of Measures of Teaching Behavior," Review of Educational Research (Fall, 1976, Vol. 46, No. 4), pp. 553-554.
15. N. L. Gage, The Scientific Basis of the Art of Teaching (New York: Teacher College Press, 1978), pp. 25-27 and pp. 29-31. Also see N. L. Gage, "The Yield of Research on Teaching," Phi Delta Kappan (November, 1978, Vol. 60, No. 3), pp. 229-235.
16. Penelope L. Peterson, "Direct Instruction Reconsidered," in Research on Teaching, eds. Peterson and Walberg, op. cit., p. 60. Also see Gene V. Glass, "Integrating Findings: The Meta-analysis of Research," in Review of Research in Education, Volume 5, ed. Lee S. Shulman (Itasca, Ill.: F. E. Peacock Publishers, 1977).
17. Gage, op. cit., p. 39. Inferences about teacher behavior and student effect have been obtained from such studies as Robert S. Soar, Final Report, Follow Through Classroom Process Measurement and Pupil Growth (1970-1971), Gainesville: Institute for the Development of Human Resources, University of Florida, 1973; Robert S. Soar and Ruth M. Soar, "An Attempt To Identify Measures of Reaching Effectiveness From Four Studies," Journal of Teacher Education (Fall, 1976, Vol. XXVII, No. 3), pp. 261-267; Jere E. Brophy and Carolyn M. Evertson, Process-Product Correlations in the Texas Teacher-Effectiveness Study: Final Report and The Texas Teacher Effectiveness Project: Presentation of Non-Linear Relationships and Summary Discussion (Austin, Texas: Research and Development Center for Teacher Education, University of Texas, 1974); Jane A. Stallings and David H. Kaskowitz, Follow Through Classroom Observation Evaluation (Menlo Park: Calif.: Stanford Research Institute, 1974); Frederick J. McDonald and P. Elias, The Effects of Teaching Performance on Pupil Learning, Beginning Teacher Evaluation Study: Phase II, Final Report, Vol. I (Princeton: N. J.: Educational Testing Service, 1976); Frederick J. McDonald, Research on Teaching and Its Implications for Policy Making: Report on Phase II of the Beginning Teacher Evaluation Study (Princeton, N. J.: Educational Testing Service, 1976); Thomas L. Good and Douglas A. Grouws, Process-Product Relationships in Fourth Grade Mathematics Classrooms: Final Report (Columbia: University of Missouri, 1975); William J. Tikunoff, David C. Berliner and Ray C. Rist, An Ethnographic Study of Forty Classrooms of the Beginning Teacher Evaluation Study Known Sample (San Francisco: Far West Laboratory for Educational Research and Development, 1975); Meredith D. Gall et al, The Effects of Teacher Use of Questioning Techniques on Student Achievement and Attitude (San Francisco: Far West Laboratory for Educational Research and Development, 1975); Nikola N. Filby and Richard S. Marliave, Descriptions of Distributions of ALT Within and Across Classes During the A-B Period (San Francisco: Far West Laboratory for Educational Research and Development, 1977); Charles W. Fisher, Nikola N. Filby and Richard S. Marliave, Descriptions of Distributions of ALT Within and Across

Classes During the B-C Period (San Francisco: Far West Laboratory for Educational Research and Development, 1977); and Donald M. Medley, Teacher Competence and Teacher Effectiveness (Washington, D.C.: American Association of Colleges for Teacher Education, 1977).

18. See Jere E. Brophy and Carolyn M. Evertson, Learning from Teaching: A Developmental Perspective (Boston: Allyn and Bacon, Inc., 1976).
19. Jere E. Brophy, "Teacher Behavior and Student Learning," Educational Leadership (October, 1979, Vol. 32, No. 1), p. 34. Also see Gage, op. cit., pp. 31-35.
20. Ibid., p. 34.
21. See Thomas L. Good and Douglas A. Grouws, "Teaching and Mathematics Learning," Educational Leadership (October, 1979, Vol. 32, No. 1), pp. 39-45; David C. Berliner, "Tempus Educare," in Research on Teaching, eds. Peterson and Walberg, op. cit.; and Wesley C. Becker and Seigfried Englemann, "The Direct Instruction Model," in America's Schools: A Decade of Experimentation, ed. Ray Rhine (New York: Academic Press, 1973).
22. Barak V. Rosenshine, "Content, Time, and Direct Instruction," in Research on Teaching, eds. Peterson and Walberg, op. cit., p. 47.
23. Gordon Cawelti, "Instructional Leadership Which Focuses on Improved Student Achievement," Impact on Instructional Improvement, New York State Association for Curriculum Development (Spring Issue, 1980, Vol. 15, No. 3), p. 36.
24. Bruce Joyce and Beverly Showers, "Improving Inservice Training: The Messages of Research," Educational Leadership (February, 1980, Vol. 37, No. 5), pp. 379-385.
25. David C. Berliner, "Tempus Educare," in Research on Teaching, eds. Peterson and Walberg, op. cit. Also see Charles Fisher, Richard Marliave and Nikola N. Filby, "Improved Teaching by Increasing Academic Learning Time," Educational Leadership, op. cit., pp. 52-54.
26. Christopher M. Clark and Robert J. Yinger, "Teachers' Thinking," in Research on Teaching, eds. Peterson and Walberg, op. cit.
27. Hilda Borko, Richard Cone, Nancy Atwood Russo, and Richard J. Shavelson, "Teachers' Decision Making," in Research on Teaching, Ibid.
28. James A. Coleman, "The Concept of Equality of Educational Opportunity," in The Inequality Controversy: Schooling and Distributive Justice, eds. Donald M. Levine and Mary Jo Bane (New York: Basic Books, Inc., Publishers, 1975), p. 213. Also see Richard D. Noonan, "Semantics of Equality of Educational Opportunity," Teachers College Record (September, 1974, Vol. 76, No. 1), pp. 63-88.